Q. State your name and business address?

A. Timothy J. Walsh

Washington Department of Natural Resources

Division of Geology and Earth Resources

P.O. Box 47007

Olympia WA 98504-7007

Q. Where are you employed and what is your job title?

A. Environmental Geology Section

Chief Geologist

Q. What is your educational background?

A. B.S. Geology, UCLA, 1976; M.S. Geology, UCLA, 1979

Q. What is your professional experience?

A. For the last ten years, I have been the chief geologist and manager, Environmental Geology Section-- Washington Department of Natural Resources, Division of Geology and Earth Resources (DGER). My duties include directing DGER's program of geologic hazards research and mitigation, and performing field investigation of geologic hazards. For nine years prior to that, I was a staff geologist for DGER conducting geologic mapping, coal exploration, and ground subsidence hazards.

Member -American Geophysical Union and Association of Engineering Geologists, Washington State Seismic Safety Advisory Committee, Washington State representative to the

Western States Seismic Policy Council, member of the board of directors and treasurer of Cascadia Regional Earthquake Workgroup, Washington State representative to the National Tsunami Hazard Mitigation Program.

Q. What is the subject matter of your testimony?

A. Olympic Pipeline's Application No. 96-1 to the Energy Facility Site Evaluation Council (EFSEC) and their Draft Environmental Impact Statement (DEIS) do not fully evaluate the known or suspected earthquake hazards that would be encountered along the pipeline route. For instance, in the DEIS p. 3-16--The existing literature does not suggest that M8.5 is a reasonable maximum magnitude for a Cascadia Subduction Zone event. The Atwater and others (1995) [Exhibit 1TJW] paper did not either. That paper argued for at least "magnitude 8 or larger" and consistently referred to magnitudes of 8-9. Subsequent work by Satake and others (1996)

[Exhibit 2TJW] argued that the tsunami that reached the shores of Japan in January, 1700, must have been generated by a magnitude 9 earthquake, probably from Cascadia. This date and magnitude were strongly supported by Yamaguchi and others (1997) [Exhibit 3TJW]. The probabilistic hazard maps (Frankel and others, 1996), which are the basis for the seismic zonation in the International Building Code and on App. No. 96-1 Figures 2.15-1a-f, use a model that combines a magnitude 9 event and a series of 8.5 events every 500 years. In short, the design earthquake magnitude for Cascadia should be 9 (or even 9.2), not 8.5.

In App. No. 96-1, page 2.15-11, the applicant claims that the pipeline will not cross the trace of any active fault, although it acknowledges the proximity to the Seattle fault and the South Whidbey Island fault. Rogers and others (1996) [Exhibit 4TJW], and Johnson and others (1996) [Exhibit 5TJW], suggest that the South Whidbey Island fault is continuous with the

Rattlesnake Mountain fault. If this is correct, then the pipeline would have to cross this longer fault and hence surface rupture may have to be considered. Additionally, if these two faults are continuous, they would be capable of a larger earthquake than would otherwise be expected for either fault alone. Also, other faults shown on Plate 1 in Rogers and others (1996 and references therein), such as those in the Kittitas Valley near Ellensburg, are not shown in Figures 2.15-1a-f or discussed in the text. EFSEC should require applicant to consider the recent literature more fully and account for a higher level of ground shaking and surface rupture potential.

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I certify and declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct to the best of my knowledge and belief.

Signed at _____,Washington on this _____day of February, 1999.

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Timothy J. Walsh